

tation for the current month was the greatest on record at: Block Island, 9.42; Narragansett Pier, 8.25; Jupiter, 6.49; Cincinnati,\* 6.80; Columbus, Ohio, 7.45; Pittsburg,\* 5.11; Oswego,\* 6.56; Sandusky,\* 6.21; Toledo,\* 5.41; Rapid City,\* 1.16; Spokane, 5.85; Walla Walla, 5.15. It was the least on record at: Tampa, 0.63; Vicksburg,\* 1.37; Des Moines, 0.34; Phoenix and Yuma, 0.00.

The total accumulated monthly departures from January 1 to the end of the current month are given in the second column of the following table; the third column gives the current accumulated precipitation expressed as a percentage of its normal value.

| Districts.              | Accumulated<br>departures. | Accumulated<br>precipitation. | Districts.                     | Accumulated<br>departures. | Accumulated<br>precipitation. |
|-------------------------|----------------------------|-------------------------------|--------------------------------|----------------------------|-------------------------------|
|                         | Inches.                    | Perct.                        |                                | Inches.                    | Perct.                        |
| New England .....       | + 0.20                     | 100                           | Middle Atlantic .....          | - 4.10                     | 90                            |
| Florida Peninsula ..... | +11.80                     | 123                           | South Atlantic .....           | - 4.80                     | 91                            |
| Middle Slope .....      | + 0.60                     | 108                           | East Gulf .....                | - 5.90                     | 88                            |
| Southern Slope .....    | 0.00                       | 100                           | West Gulf .....                | -11.30                     | 72                            |
| Southern Plateau .....  | + 3.70                     | 148                           | Ohio Valley and Tenn .....     | - 1.90                     | 95                            |
| Middle Plateau .....    | + 0.80                     | 103                           | Lower Lake .....               | - 3.50                     | 89                            |
| Northern Plateau .....  | + 2.30                     | 116                           | Upper Lake .....               | - 2.90                     | 91                            |
| South Pacific .....     | + 0.60                     | 106                           | North Dakota .....             | - 1.50                     | 92                            |
|                         |                            |                               | Upper Mississippi Valley ..... | - 2.00                     | 94                            |
|                         |                            |                               | Missouri Valley .....          | - 3.80                     | 87                            |
|                         |                            |                               | Northern Slope .....           | - 0.50                     | 96                            |
|                         |                            |                               | North Pacific .....            | - 0.70                     | 99                            |
|                         |                            |                               | Middle Pacific .....           | - 2.80                     | 88                            |

#### SNOWFALL.

The total monthly snowfall at each station, if any occurs, is given in Tables I and II. The geographical distribution of snowfall is shown on Chart VI. It will be seen that snow was general throughout Pennsylvania, New York, and the New England States, also throughout Michigan and the States westward to the Pacific. Practically no snow fell in Kansas except in the extreme northwestern portion. The snowfall of Montana, Idaho, and eastern Washington was quite heavy.

In Canada, Prof. R. F. Stupart reports snow as follows:

British Columbia: Snow on the ground from 6 to 16 inches. Northwest Territories: The precipitation was above the average and was mostly in the form of snow. The observer at Regina says: We have had a good deal of snow, but farther north, in the timber skirting the Qu'Appelle Valley, it is reported that there is at least 2 feet of snow and badly drifted; here there can not be more than 9 inches. From Swift Current a heavy snowfall is reported." Manitoba: Minnedosa, sleighing on the 15th, but roads bare in some places; at Emerson, snowfall only 3 inches. Ontario: The amount of snow on the ground at the end of the month was only from 1 inch in the southern portions to 12 inches in the northern portions. Quebec: Not more than 2 inches of snow reported in this Province. Maritime Provinces: Very little snow, not more than 2.20 inches.

#### HAIL.

The following are the dates on which hail fell in the respective States:

Arizona, 13. Arkansas, 15. California, 6, 22. Connecticut, 11. Delaware, 15. Idaho, 20. Illinois, 8. Indiana, 11, 26. Maryland, 2, 11, 17. Massachusetts, 9. Missouri, 8, 15. Nevada, 12, 24. New Jersey, 4, 11, 14, 16, 22, 29. New York, 9, 25. North Carolina, 23. North Dakota, 9. Oregon, 5, 6, 7, 13, 14, 16, 21. Pennsylvania, 2, 3, 11, 16. Virginia, 2, 11. West Virginia, 11.

#### SLEET.

The following are the dates on which sleet fell in the respective States:

Arkansas, 28. California, 6. Connecticut, 8, 15, 29. Idaho, 6, 13, 22, 23, 29. Illinois, 15, 24, 25, 26. Indiana, 1, 9, 11, 24. Iowa, 12, 15, 25, 26. Kansas, 15. Kentucky, 23. Maine, 25, 29. Maryland, 14, 23, 29. Massachusetts, 8, 29. Michigan, 5, 10, 11, 14, 15, 24, 26. Minnesota, 4, 5, 10, 13, 14, 24, 25, 29. Missouri, 15. Montana, 3, 5, 12, 19. Nebraska, 4,

9, 10, 22, 23, 24, 25, 26. Nevada, 3, 6. New Hampshire, 8, 9, 10, 11, 21. New Jersey, 13, 16, 22. New York, 6, 8, 9, 11, 12, 14, 16, 25, 27, 29. North Dakota, 13, 14. Ohio, 7, 9, 11, 12, 14, 16, 19, 22, 24, 25, 29. Oregon, 5, 6, 13, 19, 22, 28, 29, 30. Pennsylvania, 2, 10, 11, 14, 16, 22, 29. Rhode Island, 9. South Dakota, 4, 11, 13. Utah, 6, 24, 25. Vermont, 11, 12, 26. Virginia, 11, 14, 28, 29. Washington, 3, 7, 13, 14, 20, 23, 29, 30. West Virginia, 14, 28, 29. Wisconsin, 5, 10, 11, 14, 15, 25, 26.

#### WIND.

The prevailing winds for November, 1897, viz, those that were recorded most frequently, are shown in Table I for the regular Weather Bureau stations.

The resultant winds, as deduced from the personal observations made at 8 a. m. and 8 p. m., are given in Table VIII. These latter resultants are also shown graphically on Chart IV, where the small figure attached to each arrow shows the number of hours that this resultant prevailed, on the assumption that each of the morning and evening observations represents one hour's duration of a uniform wind of average velocity. These figures indicate the relative extent to which winds from different directions counterbalanced each other.

Maximum wind velocities are given in Table I, which also gives the altitudes of Weather Bureau anemometers above the ground. Maxima of 50 miles or more per hour were reported during this month as follows (maximum velocities are averages for five minutes; extreme velocities are gusts of shorter duration, and are not given in this table):

| Stations.                | Date. | Velocity. | Direction. | Stations.              | Date. | Velocity. | Direction. |
|--------------------------|-------|-----------|------------|------------------------|-------|-----------|------------|
|                          |       | Miles     |            |                        |       | Miles     |            |
| Block Island, R. I. .... | 9     | 54        | nw.        | Chicago, Ill. ....     | 1     | 52        | ne.        |
| Buffalo, N. Y. ....      | 6     | 56        | w.         | Do. ....               | 10    | 55        | sw.        |
| Do. ....                 | 12    | 54        | w.         | Do. ....               | 14    | 50        | se.        |
| Fort Canby, Wash. ....   | 8     | 50        | se.        | Cleveland, Ohio. ....  | 11    | 68        | w.         |
| Do. ....                 | 9     | 58        | s.         | Denver, Colo. ....     | 10    | 51        | w.         |
| Do. ....                 | 16    | 66        | se.        | Eastport, Me. ....     | 12    | 60        | ne.        |
| Do. ....                 | 17    | 87        | se.        | Lexington, Ky. ....    | 9     | 50        | w.         |
| Do. ....                 | 18    | 88        | se.        | New York, N. Y. ....   | 9     | 54        | w.         |
| Do. ....                 | 20    | 56        | se.        | Do. ....               | 13    | 52        | nw.        |
| Carson City, Nev. ....   | 10    | 59        | sw.        | Portland, Oreg. ....   | 18    | 52        | s.         |
| Do. ....                 | 19    | 52        | sw.        | Woods Hole, Mass. .... | 9     | 57        | sw.        |
| Do. ....                 | 21    | 51        | sw.        | Do. ....               | 10    | 52        | w.         |
| Cheyenne Wyo. ....       | 10    | 54        | w.         | Do. ....               | 12    | 60        | sw.        |

#### ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table IX, which shows the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month, respectively.

Thunderstorms.—The dates on which the number of reports of thunderstorms for the whole country were most numerous were: 8th, 64; 9th, 59; 14th, 62; 26th, 58.

Reports were most numerous from: Illinois, 83; Indiana, 49; Missouri, 59; Ohio, 56.

Thunderstorm days were most numerous in: Illinois, 14; Indiana, 10; Missouri and Ohio, 12.

In Canada.—Thunderstorms were reported at Grand Manan on the 6th and 9th.

Auroras.—The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz, from the 4th to the 12th, inclusive. On the remaining twenty-one days of this month 54 reports were received, or an average of about 2 per day. The dates on which the number of reports of auroras for the whole country especially exceeded this average were: 2d, 4; 17th and 24th, 8.

\* Observations cover a period of over twenty-five years.